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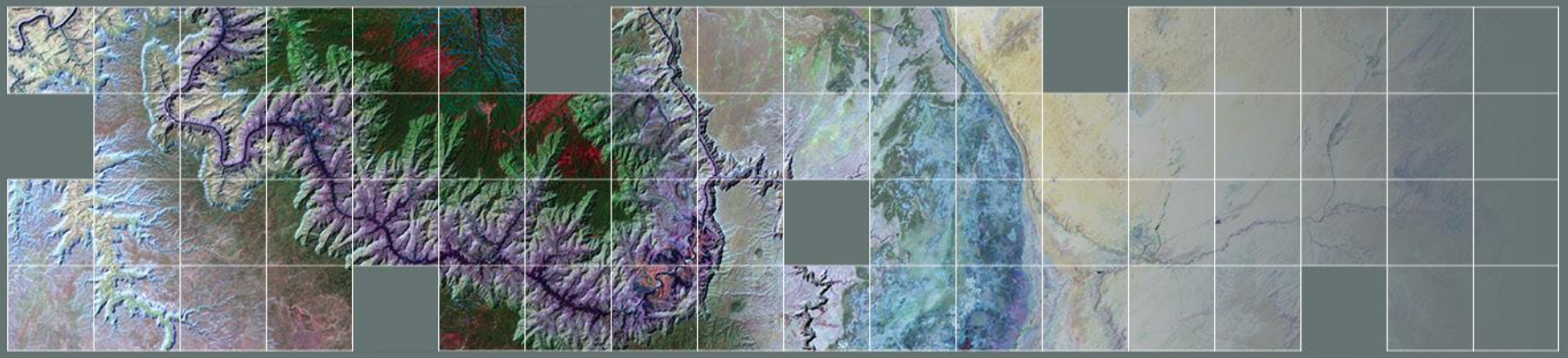
science for a changing world

Climate and Land Use Change
Earth Resources Observation and Science (EROS) Center

USGS Sentinel-2 Status



John Dwyer
February 4, 2015
Landsat Science Team

U.S. Department of the Interior
U.S. Geological Survey

USGS Plans for Sentinel-2 Data

- **Presented Investigation Summry "Sentinel-2 Augmentation to Landsat Data Record" to Land Remote Sensing Program October, 2014**
  - Scope and Ops Con assumptions used for analysis
  - Investigation Analysis & Findings
  - Architecture Recommendation & Implementation Summary
  - Risks & Considerations
  - Work packages and associated cost estimates
- **Collaborating with NASA on pre-flight calibration to data characterization to define science data processing to ensure Landsat and Sentinel-2 data synergy**

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Implementation Tiers and Options

- **Implementation Tiers:**
  - ✓ **Tier 1: EROS will pull a copy of all L1C data from ESA, host a copy at EROS, generate a Full Resolution Browse (FRB) and enable basic data discover capabilities (no other processing included)**
  - **Tier 2:** In addition to Tier 1, add a minimal amount of processing necessary to increase usability of the data, including reformatting data to be more consistent with Landsat Level 1 and resampling the Level 1C data to a 30m common grid and tiling scheme (Landsat-like) for distribution as an on-demand Landsat-like product
  - **Tier 3:** This is a separate and parallel scenario to Tier 2 to render the MSI data interoperable with Landsat and significantly increase the usability/utility of the data for research/applications and makes the data as seamlessly similar as possible to Landsat data for the user (feasibility pending and therefore, not yet estimated)
- **Additional defined options:**
  - ✓ **Option 1: Increase disk cache for S2 data from 180 days to 360 days and add 10% each year (base assumption includes 180 days of spinning disk) to improve user experience**
  - **Option 2:** Generate surface reflectance products from S2 data and archive and distribute to the public (currently assuming use of NASA Ames Research Center (ARC) for processing SR data)
  - **Option 3:** Provide coincident search and discovery of both inventories (Landsat & S2) simultaneously in EarthExplorer and provide aggregated results (feasibility pending and therefore, not yet estimated)
- **Scope and Schedule remain contingent upon available funding**

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FY15 Milestones and Deliverables

Executive Milestones	Status	Start Date	End Date	Notes/Deliverable
FY15a Hardware Procurement Submission -2 months IT approval -1 month TSSC award -2 months to purchase and delivery	In Process	Nov 2014	May 2015	Hardware procurement critical path – if not in place, will not be able to support Sentinel data ingest and delivery.
Sentinel-2A Software Requirements definition	In Process	Jan 2015	Apr 2015	Inventory, EE change requests
Sentinel-2A SW Dev initiated	Future	Feb 2015	Jul 2015	Ingest, Inventory, EE, GloVis, TRAM
Sentinel-2A Launch	Future	Apr 2015	Jun 2015	Launch of first Sentinel-2 satellite
Document Sentinel-2 data characterization	Future	Apr 2015	Oct 2015	Analysis and recommendation for 30m Landsat like product
FY15a Hardware Integration	Future	May 2015	Jun 2015	Integrate hardware into existing architecture – Network switch, SAN switch, tape drives, ingest server, 1st and 2nd tier disk.
Sentinel-2A System testing	Future	Jul 2015	Dec 2015	System Testing Ingest, Inventory, EE, GloVis, TRAM
Sentinel-2A Receive L1C test data from ESA	Future	Jul 2015	Dec 2015	Validate process flow and data
Sentinel-2 ORR	Future	Aug 2015	Aug 2015	Operation Readiness Review for production release to support Sentinel-2 archive and distribution.
Sentinel-2 L1C test data availability	Future	Aug 2015	Aug 2015	Test data made available for limited access
FY16 Hardware Procurement initiation	Future	Oct 2015		Hardware procurement outline in FY16 budget
Sentinel-2A L1C data available for download	Future	Jan 2016		Sentinel-2 data release

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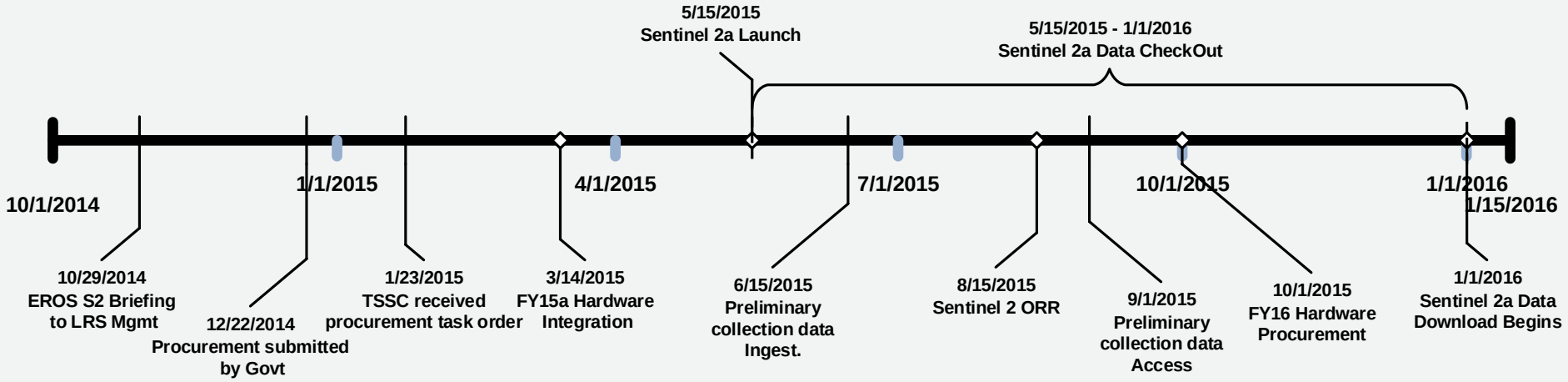
Tier 1 Timeline



USGS Plans for Sentinel-2 Data

QTY	HW Description
1	Sentinel Ingest server
2	T10K-d tape drives
1	LTO-6 tape drive
1	SAN 96 port fibre switch
1	1.2TB Solid State Disk to augment Inventory Database
2	V3700 dual ctrl with SSD/SAS -- CR1MSS 1st tier disk (L1C/FRB/WMS) ~35TB
2	V3700 exp tray with SAS disk -- CR1MSS 1st tier disk (L1C/FRB/WMS)
2	V3700 dual ctrl with 12x4TB disk -- CR1MSS 2nd tier disk -- ~2x288TB
12	V3700 additional disk tray with 12x4TB disk -- CR1MSS 2nd tier disk
1	Network infrastructure -- Extreme Black Diamond 8810 core switch
1	Juniper firewall (upgrade to existing asset)
2	Rack for additional hardware

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